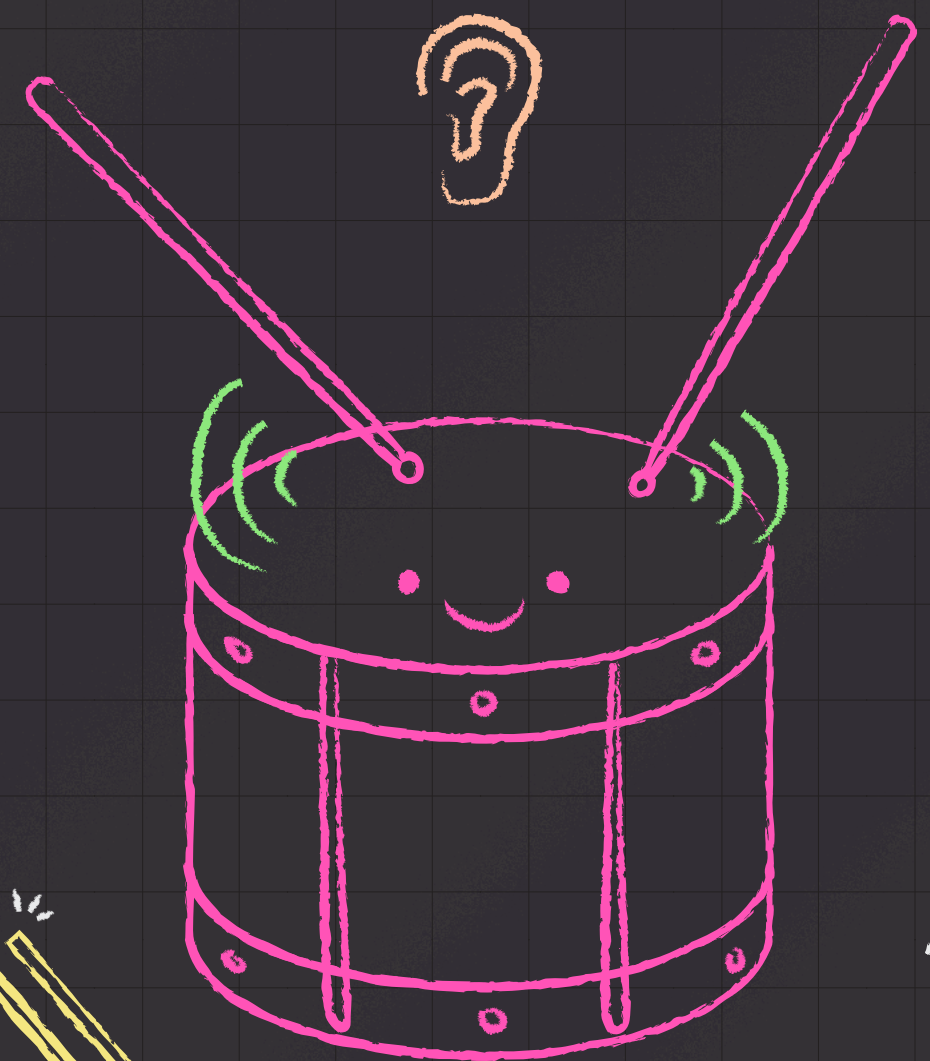


MINNESOTA



ORCHESTRA



SCIENCE OF SOUND

CONCERT GUIDE

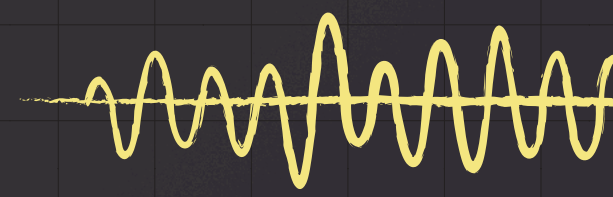
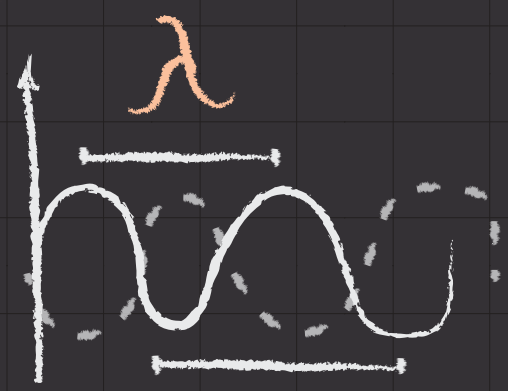
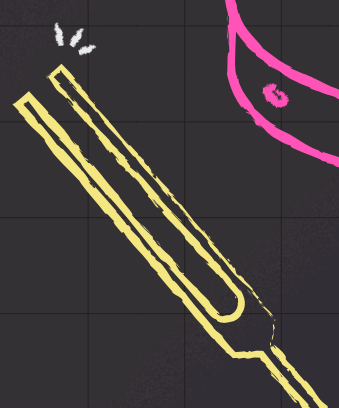




Table of Contents

3 **Guide to the Orchestra**

4 **Concert Program**

5 **Activities**

15 **Printables**

Guide to the Orchestra



Violin
String Family



Viola
String Family



Double Bass
String Family



Piccolo
Woodwind Family



Flute
Woodwind Family



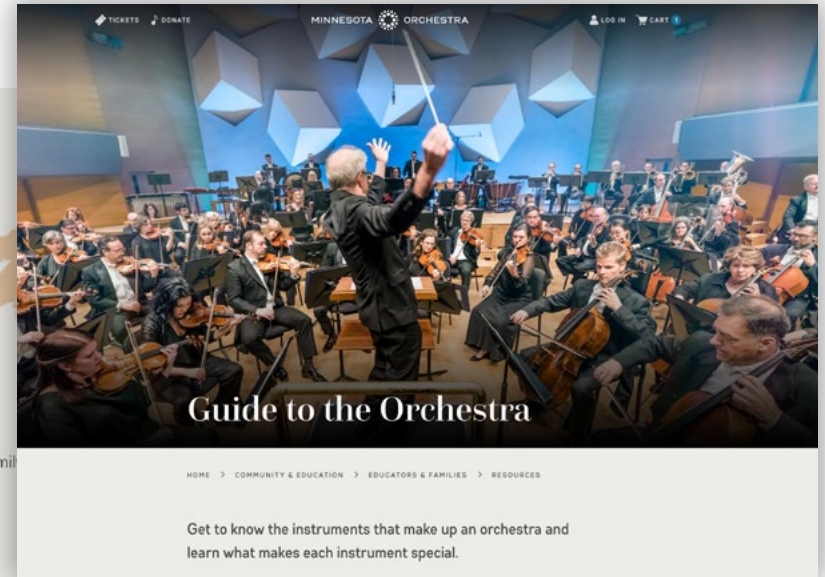
Oboe
Woodwind Family



Clarinet
Woodwind Family



Bassoon
Woodwind Family



Visit our [Guide to the Orchestra](#) to learn about the instruments of the orchestra. You'll see photos of the instruments, descriptions, and short video demonstrations too!

| | |
|-------------|---|
| Zhou | <u><i>First Sight</i></u> |
| Schumann | <u><i>Symphony No. 3, III. Nicht Schnell</i></u> |
| Sibelius | <u><i>Violin Concerto, III. Allegro, ma non tanto</i></u> |
| Brahms | <u><i>Hungarian Dance No. 5</i></u> |
| Tchaikovsky | <u><i>Eugene Onegin, Polonaise</i></u> |
| Bunch | <u><i>Symphony No. 1, I. Varoom!</i></u> |
| Higdon | <u><i>City Scape, III. Peachtree Street</i></u> |





Zhou Tian

b.1981
MODERN PERIOD

Key Vocabulary

Ternary form/ABA form: A pattern in music where we hear a set of musical ideas, then something different, then a return to the first musical idea.

Tempo: The speed or pace of a piece of music or a section of a piece of music.

Dynamics: The volume of a piece of music or a section of a piece of music.

Instrumentation: The combination of instruments in any particular piece of music or a section of a piece of music.

Just Listen

This exciting and energetic piece was inspired by the folk dances of the Dai people of China's Yunan Province. As you listen, imagine what movements might go along with the music. Notice when the dance moves speed up or slow down.

Focus on structure and expression

- In the piece *First Sight*, composer Zhou Tian uses a three-part musical form called ternary form, or ABA form. This means we hear one thing, then something different, then a return to the first thing.
- When they use ternary, or ABA form, composers have many different ways of making the "B" section in the middle sound different. Here are a few things that composers can change to create contrast in the middle section:
 - Dynamics
 - Tempo
 - Instrumentation
- Use [Printable 1](#) as you listen to *First Sight*. In the box below each section, use words, music vocabulary or pictures to help describe each section and take note of the contrasting elements.
- Optional extension: create your own ABA composition. Will you use dynamics, tempo or instrumentation to make a contrasting "B" section? Maybe you will use all three!

Learning Checklist

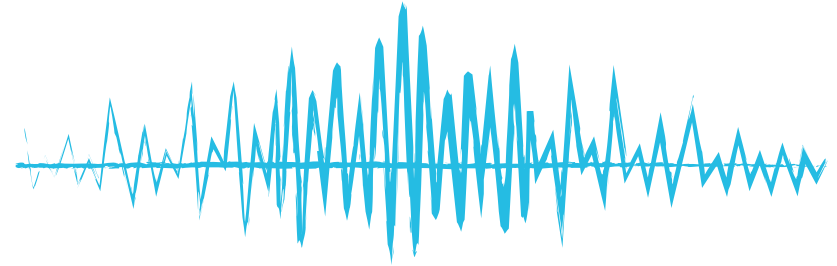
- I can demonstrate active listening.
- I can use descriptive words to identify contrasting sections in music.
- I can demonstrate understanding of ABA form, also known as *ternary* form.



Robert Schumann

(1810-1856)

ROMANTIC PERIOD



Key Vocabulary

Symphony: A form of musical composition for orchestra. Symphonies sometimes have separate *movements*, or sections.

Melody: A series of pitches, also known as a tune.

Melodic contour: the shape of the melody, or tune, that moves higher or lower

“Nicht schnell”: Means “not fast” in the German language.

Just Listen

Robert Schumann’s Third Symphony was inspired by a trip he took with his wife Clara. They traveled along the Rhine River in Germany. As you listen, imagine how the music might have been inspired by a peaceful and relaxing vacation or a peaceful flowing river, or both.

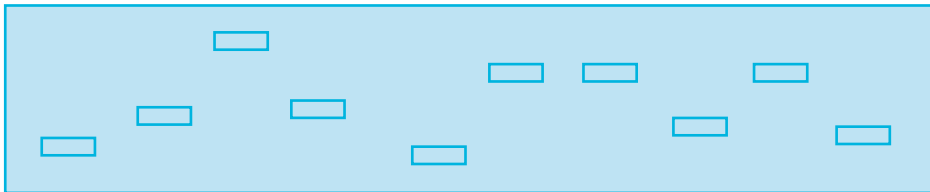
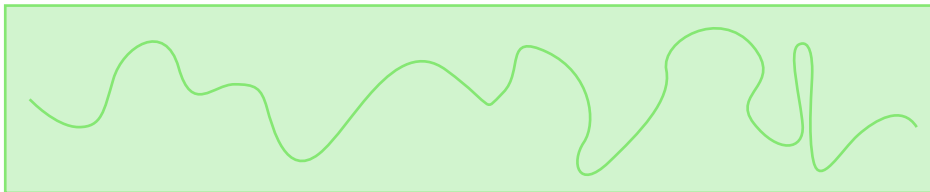
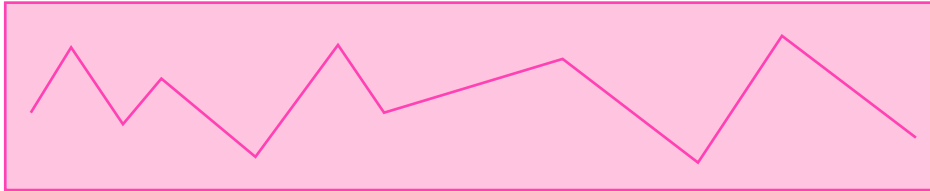
Focus on melodic contour and expression

- Melodies are a series of pitches that make up the tune of a piece of music, the part you might be able to sing along with using your voice. Melodies can have many shapes. Musicians refer to the shape of the melody as the *melodic contour*.
- Think about the different shapes a line of melody might have. Sometimes the shape might be jagged, with sharp ups and downs. Sometimes the shape might get higher or lower, like moving up and down a staircase. Sometimes the shape might stay in the same place, if a pitch is repeated over and over. Sometimes, there might be a little space, or silence, between pitches.

Activity #2

Schumann, Symphony No. 3, III. Nicht Schnell

- Look at the three shapes in the table below. Trace your finger in the air to try to recreate those shapes. Use your voice or a melodic instrument (like a xylophone) to try to create that shape with sound.



- Finally, look at the notes in the melody of the piece by Robert Schumann. Trace that shape in the air as well, and notice how it moves. At the beginning of the piece, the composer wrote “Nicht schnell”, which means “not fast” in German. Listen to the music and notice that the speed of the melody is not fast.



[source](#)

Learning Checklist

- I can explain what melodic contour means.
- I can notice, describe and imitate a variety of melodic shapes.



Jean Sibelius

(1865-1957)

LATE ROMANTIC PERIOD

Key Vocabulary

Concerto: A musical composition that features a soloist accompanied by a larger ensemble of musicians. Sometimes concertos have several different movements, or sections.

Technique: All the physical things a musician needs to do with their body to make a great sound come out.

Virtuosity: The skill of playing a very difficult piece extremely well. A very skilled musician can be called a *virtuoso*.

Sound waves: A wave produced by the vibration of an object.

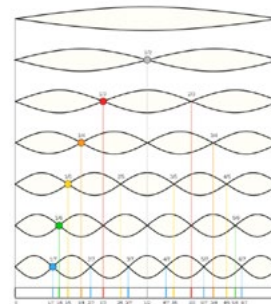
Frequency: How often a sound wave goes through its cycle in a given amount of time.

Just Listen

A concerto is a piece of music that features a solo musician accompanied by a larger ensemble of musicians. The violin is the featured instrument in this concerto by Finnish composer Jean Sibelius. In the third movement, we first hear an exciting, energetic rhythm played on the timpani. Then the violinist enters, matching that fast and dramatic mood. The piece involves a lot of advanced *technique*, or skill, for the violin player. When a piece requires a lot of difficult technique, we say it has *virtuosity*, or that the player is a *virtuoso*. As you listen, notice the virtuosity, or skill, that the violinist must have. How much practice do you think it takes to learn a piece like this? As the piece continues, notice how different instruments of the orchestra support or echo melodies and rhythms from the solo violin part.

Focus on wavelength, frequency and harmonics

- Staff from the Science Museum of Minnesota explained that sound travels in waves. We also learned that a wave has frequency, which describes how often the wave cycles in a certain amount of time.
- On a stringed instrument, like the violin, the thicker, bigger strings produce lower frequencies, which means lower pitches. The thinner, smaller strings produce high frequencies, which means higher pitches.
- Using their fingers to change the length of each string, violinists can produce many pitches from low to high, and everything in between.



[source](#)

- The chart to the left shows one single wavelength on top. Imagine that top image as a vibrating string. If you were to press that string down in different places, the wave would have a different frequency and the sound would have a different pitch.

- Listen again to the third movement of the Violin Concerto. Can you imagine how often the frequency is changing? Think about how much technique the violinist must have to change the length of the strings with such speed and precision.
- Use the follow up questions to reinforce and ensure comprehension.

- What does the vibration of an object create?

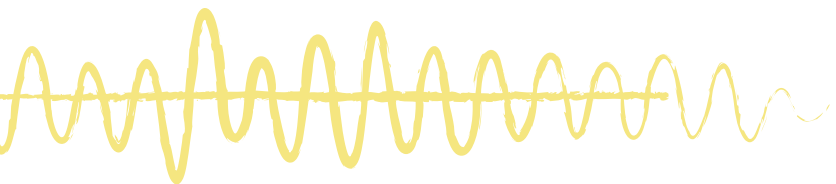
That's right—a sound wave! What word explains how often the wave cycles in a certain amount of time?

- How do violinists change the pitch on their instrument?

That's right! Using their fingers to push down a string creates different lengths of vibration on the string, and that means different frequencies, and that means different pitches.

- What kind of a string would create the lowest frequencies? How about the highest?
- Fill in the blanks with the words **higher** and **lower**: Decide which word goes in which blank.

“Higher frequencies create _____ pitches. Lower frequencies create _____ pitches.”



- Optional extension: Experiment with waves and frequencies.

Find a piece of cardboard or corkboard.

Place two push pins across from each other.

Stretch a rubber band so that it loops over each push pin.

Pluck the rubber band and watch and listen to the vibration it creates.

Press the rubber band down in various places and notice how the vibration and sound change.

Experiment with different distances between push pins and a variety of sizes of rubber bands.

The staff from the Science Museum of Minnesota give some more suggestions for how to experiment with rubber bands and vibration in one of their Science of Sound videos.

Learning Checklist

- I can explain that sound moves in waves.
- I understand that waves have frequency.
- I can explain that changing the frequency affects the pitch, or how high or low the sound is.



Johannes Brahms

(1833-1897)

ROMANTIC PERIOD

Key Vocabulary

Csárdás (ZHAHR-dahs): Folk dance common in Hungary.

Tempo: The speed or pace of a piece of music or a section of a piece of music.

Dynamics: The volume of a piece of music or a section of a piece of music.

Forté: The musical word for loud/strong music.

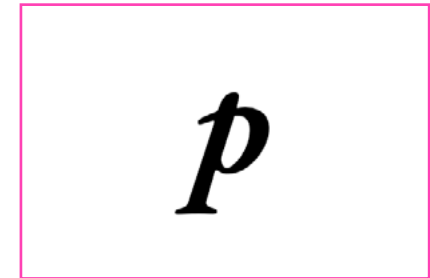
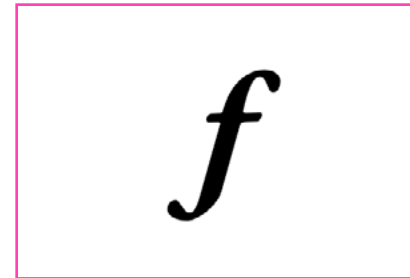
Piano: The musical word for quiet/soft music.

Just Listen

Like Zhou Tian's piece *First Sight*, this piece is inspired by folk dancing. Composer Johannes Brahms wanted to capture the dramatic movements of a Hungarian folk dance called the *csárdás*. A *csárdás* often has dramatic changes in *tempo* and *dynamics*. As you listen, imagine how the dance moves might change according to the speed and volume of the music.

Focus on dynamics

- The Italian word *forte* tells musicians when to play or sing loudly or strongly. The symbol for forte is *f*.
- The Italian word *piano* tells musicians when to play or sing quietly or softly. The symbol for piano is *p*.
- Make *forte* and *piano* flash cards. They might look like the images below or you can use [Printable 2](#).



- Listen again to Hungarian Dance No. 5 by Johannes Brahms. Use your flash cards to show you hear when the music is *forte* and when it is *piano*.
- Can you think of other pieces of music you know that use contrasting dynamics? Tell a friend, teacher or someone at home about a favorite piece that has interesting dynamics.

Learning Checklist

- I can demonstrate understanding of dynamics.
- I can use music vocabulary to describe the dynamics of a piece of music.



Peter Ilyich Tchaikovsky

(1840-1893)

ROMANTIC PERIOD

Key Vocabulary

Polonaise (pah-uh-NAYZ): A dance of Polish origin.

Melody: A series of pitches, also known as a tune.

Harmony: When two or more pitches are played at the same time.

Consonance: A combination of pitches that create a stable chord.

Dissonance: A combination of pitches that creates an unstable chord.

Just Listen

More dancing! A *polonaise* is a dance from the country of Poland. This polonaise, by composer Peter Ilyich Tchaikovsky, begins with a fanfare in the brass. Imagine the fanfare getting the attention of dancers at a party—it's a signal that the dance is about to begin! The dancing really begins about 25 seconds into the piece, when we hear a special rhythm that is common in a polonaise. Tchaikovsky's polonaise was from an opera he wrote called *Eugene Onegin*. This piece was used during a big ball scene, with lots of party guests. As you listen, imagine all the dancers at a fancy party.

Focus on harmony

- When we hear a series of pitches in a row, one after another, we call this *melody*. When more than one pitch is played at the same time, *harmony* is created.
- Different combinations of pitches create different effects. Two or more pitches played together that create a stable sound is called *consonance*. Two or more pitches that are played together that create an unstable sound is called *dissonance*.
- Composers use consonance and dissonance on purpose to have the listener feel different things.
- In the *Polonaise* from *Eugene Onegin*, Peter Tchaikovsky used a lot of instruments, so he could make sure there were lots of notes happening at once, creating a lot of harmony. Sometimes the harmony is consonant and sometimes it is dissonant.

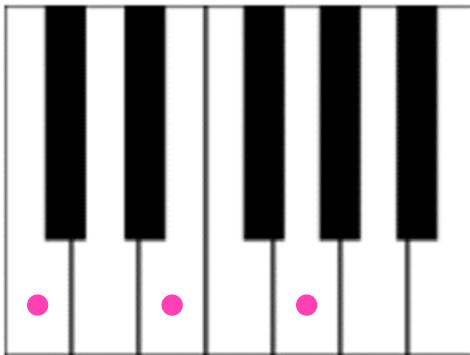
Activity #5

Tchaikovsky, *Eugene Onegin*, Polonaise

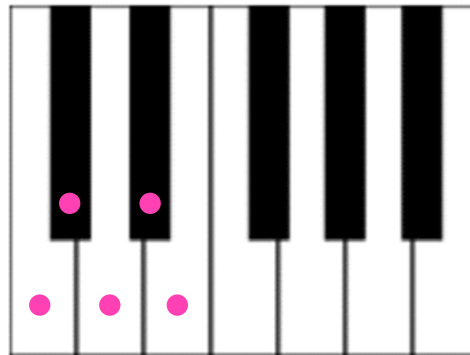
- If you have access to a piano, keyboard, or piano app, try creating some different harmonies. Try to describe how you feel when you hear consonant harmonies, what is happening to your body? Are there any images that come to your head? Now do the same thing with dissonant harmonies.

Here are some suggestions below:

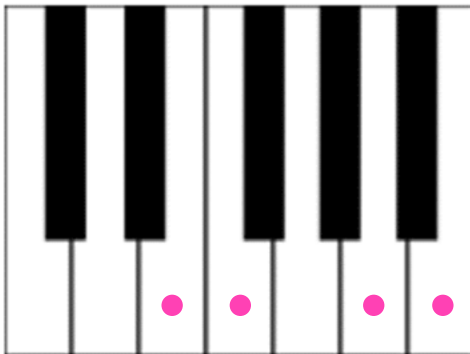
C, E, G



C, C#, D, D#, E



E, F, A, B



- What other combinations can you come up with?

Learning Checklist

- I understand the definition of melody, harmony, consonance and dissonance.
- I can experiment with playing more than one note at a time and creating harmony, consonance and dissonance.



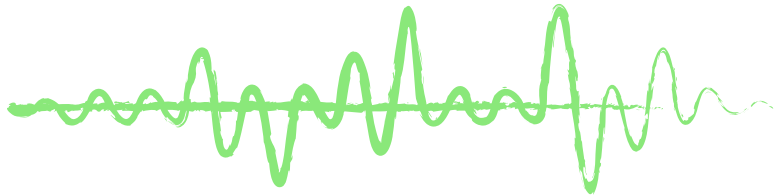
Kenji Bunch

b.1973

MODERN PERIOD

Key Vocabulary

Timbre (TAM-ber): The unique and special sound of any musical instrument.



Just Listen

This piece was inspired by a piece of art by the artist Roy Lichtenstein. His style was referred to as pop art, since it was inspired by modern culture and mass media. As you listen, notice that many of the sounds are ones that you might hear in popular art forms like cartoons or movie soundtracks.

Focus on timbre

- Instruments are made from different materials. The vibration of a wood instrument creates a different sound than the vibration of a metal instrument. We use the word timbre to describe the unique and special sound each instrument makes.
- Thinking about what materials an instrument is made of helps us sort and identify timbres. Using [Printable 3](#), in the box under the instrument, write the instrument name, its instrument family, and the materials that vibrate to make a sound on that instrument.

Learning Checklist

- I can identify instruments of the orchestra.
- I can sort instruments of the orchestra into families.
- I can explain the meaning of timbre and how the material an instrument is made of affects timbre.



Jennifer Higdon

b.1962

MODERN PERIOD

Key Vocabulary

Timbre (TAM-ber): The unique and special sound of any musical instrument.

Percussion: A family of instruments that includes any instrument that makes a sound when it is hit, shaken or scraped.

Mallets: A stick used to strike a percussion instrument. A mallet might have a ball made of plastic, felt, wood or yarn at the end of it. The materials used in a mallet also affect the timbre of the instrument.

Just Listen

In her piece *City Scape*, composer Jennifer Higdon wanted to create a “metropolitan sound picture in orchestral tones.” So she used all of the timbres in the orchestra to help paint this sound picture. As you listen, think about all the sounds of a big city, and notice how Higdon used instrument timbres to try to imitate or recreate those sounds with instruments.

Focus on the percussion family and timbre

- In the middle of *Peachtree Street*, there is an extended section featuring three percussion instruments: the xylophone, the glockenspiel and the timpani.
- These three instruments are all members of the percussion family, which means that they produce sound by being hit, shaken or scraped.
- These instruments are all made out of different materials, which means they all have different timbres. On each of these instruments, the player uses mallets to create the sound.
- Experiment with materials and mallets and listen to the timbres that different materials create.

Find a few long, straight sticks. Chopsticks, wood dowels or drumsticks all work well.

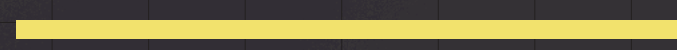
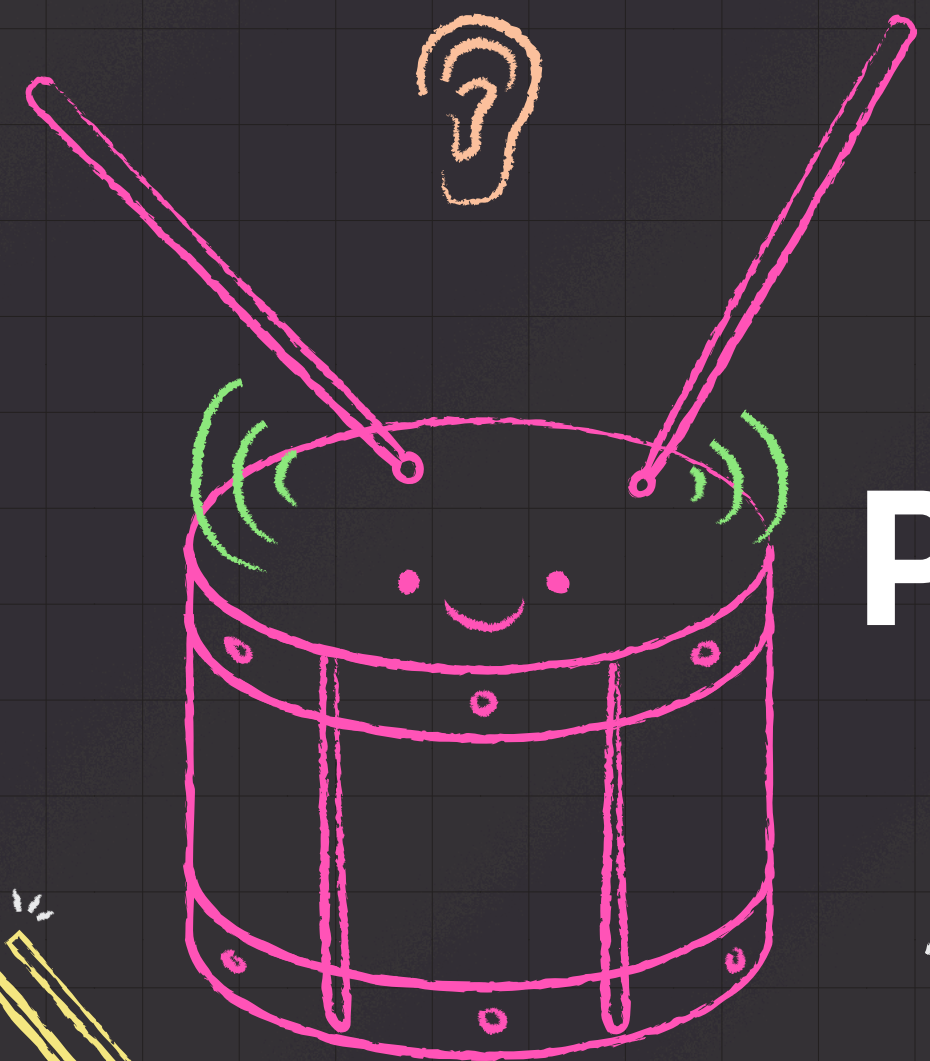
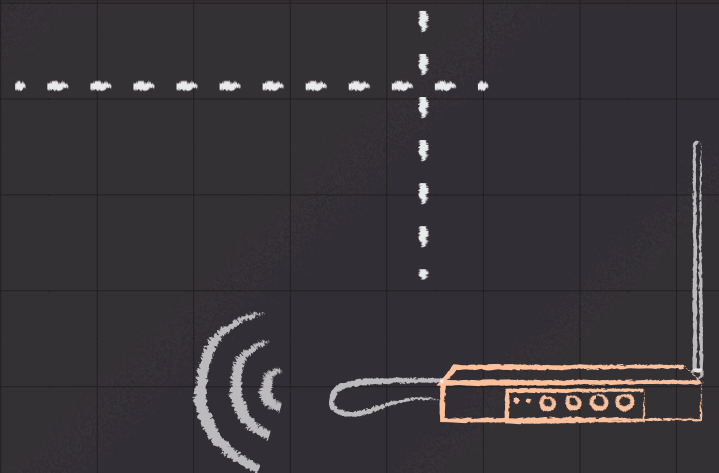
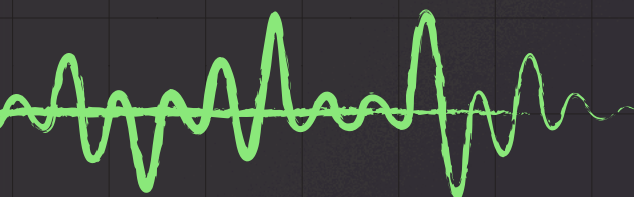
Find three or four different materials to wrap around the end of the stick. Duct tape, rubber bands, and yarn all work well. You can also try taping a rubber bouncy ball to the end of a stick.

Use your homemade mallets to tap on different surfaces. Use questions like the one below to guide your exploration.

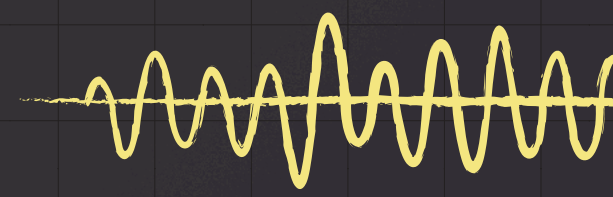
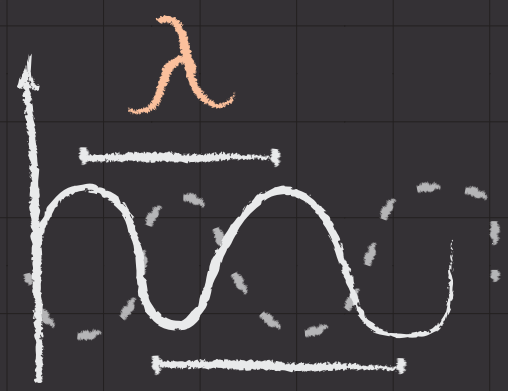
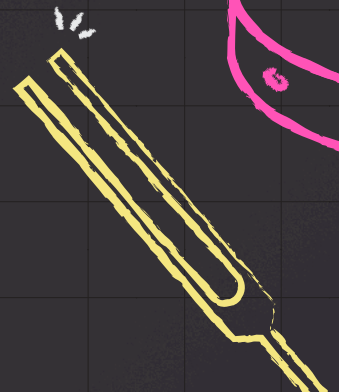
- What would it sound like if I tapped a rubber mallet on a metal surface?
- How does it sound if I tap that same mallet on a wooden surface?
- Keep mixing and matching different mallets with a wide variety of surfaces. Compare and contrast the sounds and timbres you hear. Use a listening log like the one in [Printable 4](#) to record your observations.

Learning Checklist:

- I can explain the definition of a percussion instrument.
- I understand how materials affect timbre in music.
- I can compare and contrast various timbres.



PRINTABLES



FIRST SIGHT LISTENING GRID

| A 0:00-1:18 | B 1:19-3:02 | A 3:03-5:08 |
|-----------------------|-----------------------|-----------------------|
| | | |
| | | |

*All timings are approximate.

HUNGARIAN DANCE DYNAMICS FLASH CARDS

f

p

INSTRUMENT IDENTIFICATION GRID



INSTRUMENT IDENTIFICATION GRID



LISTENING OBSERVATION LOG

| MALLET DESCRIPTION (describe the material at the end of the mallet) | SURFACE DESCRIPTION (what are you hitting with the mallet?) | LISTENING OBSERVATIONS (what do you hear?) |
|---|---|--|
| | | |
| | | |
| | | |
| | | |